CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS

Chapter 4.00

PORTLAND CEMENT CONCRETE BASE

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4.00 GENERAL

The concrete base shall be constructed on an approved subgrade in accordance with these Specifications, in conformity with the lines, grades and typical cross sections shown on the plans. The combined curb and gutter shall be used as side forms for the construction of the base, when appropriate.

4.01 RELATED ITEMS SPECIFIED ELSEWHERE

Chapter 1 Pavement Construction & Reconstruction
Chapter 2 Earthwork
Chapter 11 Portland Cement Concrete

4.02 MATERIALS

A. CONCRETE

Concrete for new base pavement construction (Asphaltic Concrete Pavement, Class 1) shall be LB-2750 and concrete for replacement or repair of concrete base shall be L-3500 as described in Chapter 11 of these Specifications unless indicated otherwise on the Plans or Special Provisions.

B. CURING COMPOUND

Curing Compound for base construction shall be either Translucent Liquid Membrane-Forming Type or Emulsified Asphalt.

1. Translucent Liquid Membrane-Forming Type

Translucent Liquid Membrane-Forming Type curing compound shall conform to "Standard Specifications for Liquid Membrane -Forming Compounds for Curing Concrete", ASTM Designation C 309, Type 1, Class B. Only curing compounds included on the latest edition of the NDOR Approved Products list shall be used unless otherwise approved by the Engineer.

2. Emulsified Asphalt

Emulsified Asphalt used as cure for concrete base shall conform to "Standard Specification for Emulsified Asphalt", ASTM D 977. The Emulsified Asphalt shall be homogeneous after thorough mixing provided separation has not been caused by freezing. Emulsified Asphalts separated by freezing shall not be used. Only Emulsified Asphalts included on the latest edition of the NDOR Approved Products list shall be used unless otherwise approved by the Engineer.

4.03 PREPARATION OF SUBGRADE

The subgrade shall be prepared as specified in Chapter 2 of these Specifications. To prevent the absorption of moisture from the newly deposited concrete, the subgrade shall be kept moist by light applications of water until the concrete base has been placed.

No direct payment will be made for preparation of subgrade. Subgrade preparation shall be considered subsidiary to other items of work for which direct payment is made.

4.04 FORMS

The outside form for the construction of concrete base shall be the combination curb and gutter. Alternate forms, when required, shall be steel or wood. Steel forms shall have a minimum base width of six inches and a minimum length of ten feet, and shall be equipped with an adequate locking device. Wood forms may be used only on curves of less than 150 feet radius. The depth of all forms shall be equal to at least the depth of the concrete being placed. No built up forms will be permitted.

All forms shall be free from bends and warps at all times. They shall be cleaned thoroughly each time they are used and adequately oiled before concrete is placed against them. The forms shall be set so that they rest firmly through their entire length on thoroughly compacted subgrade. They shall be set accurately to line and grade and sufficiently braced to resist the pressure of the concrete. Forms shall be set at least 150 feet ahead of the paving operation.

Sufficient forms shall be provided so they may remain in place 12 hours or more after the concrete has been placed.

No direct payment will be made for forms. Form work shall be considered subsidiary to other items of work for which direct payment is made.

4.05 CONCRETE PLACEMENT

A. GENERAL

The concrete shall be deposited uniformly on the prepared subgrades and distributed to the required depth over the entire width of the pavement by approved methods, struck off and finished as hereinafter provided. The Concrete placement operation shall be carried out in such a manner as to ensure that there will be no separation of the aggregate and the mortar.

BASIS OF PAYMENT

1. New Pavement Construction

   Concrete Base Course constructed in new paving projects shall not be measured or paid for directly. Payment for Concrete Base Course shall be made as provided in Chapter 1 of these Specifications.

2. Pavement Replacement (Patching)

   When Pavement replacement or repair is required on the project, the method of measurement and payment shall be as provided in Chapter 1 of these Specifications.

B. VIBRATING

All concrete shall be thoroughly compacted by means of approved mechanical vibrators. The vibrator shall consolidate the full depth and width of the concrete to a uniform mass without segregation and free from excessive surface mortar at a single passage of the machine.

Machine mounted vibrators shall be operated only when the machine to which they are attached is moving. The vibrators shall be placed so as to allow a minimum of overlap vibration.

4.05 CONCRETE PLACEMENT (Continued)

C. FINISHING

The concrete shall be deposited in such a manner that adequate concrete remains ahead of the screed and the finish machine so that they provide the cross section required. The concrete will then be further consolidated and finished mechanically with a power-driven machine approved by the Engineer. The finish machine shall be operated over the entire width of the base and shall achieve uniform consolidation.

The finishing machine shall be kept in good repair at all times and shall operate so as to give the desired finish over the entire surface of the pavement. The forward speed of the finishing machine shall be adjusted to the average progress of the concrete production, in order that the strike-off operation shall be as continuous and uninterrupted as possible.

The screed on the finish machine shall be constructed of metal and shall have sufficient strength and stiffness to retain its shape under all working conditions. The working or screeding edge shall be shaped to match the required cross section of the pavement. The screed shall be operated so that when riding on the gutter pan, which shall be used as the side forms for the base, the working edge will have an excess of concrete above grade. The contact surfaces of the wheels of the finishing machine shall be kept free from concrete and earth. Hand tools that perform the function of the finishing machine shall be immediately available for use in the event of an emergency.

The pavement shall be given its final finish by means of a wet burlap drag. The drag shall be pulled in a longitudinal direction only. The drag shall be adequately maintained so that the resultant finish shall be uniform in appearance.

All small or irregular areas shall be finished by methods approved by the Engineer.

No measurement or direct payment shall be made for placing, vibrating or finishing the concrete base. These items shall be considered subsidiary to other items of work for which direct payment is made.

4.06 JOINTS

A. CONSTRUCTION JOINTS

When placing of concrete is interrupted, for any reason, for over ½ hour, the concrete base shall be finished against an approved plank header, placed in a vertical position and extending completely across the roadway. Special care shall be taken to consolidate the concrete against the surface of the plank.

B. CONTROL JOINTS

Control joints shall be placed in the concrete base both longitudinally and transversely throughout the entire length of the construction. Longitudinal joints shall be placed at approximately the one-third (1/3) points of the slab width for pavements having a total width of 33 feet or less, and at the quarter points of the slab width for pavement having a total width greater than 33 feet but less than or equal to 44 feet. Transverse control joints shall be placed at intervals of 30 feet and shall line up with joints in the curb or combined curb and gutter.

Control joints shall be cut to a depth of at least one-third (1/3) of the concrete thickness by such methods that may be approved by the Engineer.

4.06 JOINTS (Continued)

C. LONGITUDINAL CONSTRUCTION JOINTS

All longitudinal construction joints in concrete base shall be constructed with a metal keyway and tied to adjoining slabs with tie bars of a size and spacing as provided in the drawings.

No measurement or direct payment shall be made for joint construction. The construction of joints shall be considered subsidiary to other items of work for which direct payment is provided.

4.07 CURING AND PROTECTION

A. CURING

Curing shall be accomplished using either Liquid Membrane Curing Compound or Wet Burlap.

1. Curing With Liquid Membrane Curing Compound

   Immediately after the concrete has been finished, the concrete surface shall be sealed with a uniform application of a membrane curing compound as described previously in this chapter. An approved self propelled mechanical power sprayer shall be used to apply the curing compound to the concrete pavement except that approved manual spraying equipment may be employed on narrow or variable width sections where the use of a self propelled mechanical power sprayer is impractical, and on irregular sections of street returns and alley returns. The self propelled mechanical power sprayer shall be of sufficient width to cover the entire width of the pavement.

2. Curing With Wet Burlap

   Immediately after the concrete has been finished, burlap shall be carefully placed on the concrete and kept moist in a manner which will not damage the pavement surface. The burlap shall be clean, evenly woven, free of encrusted concrete or other contaminating materials, and shall be reasonably free from cuts, tears, broken or missing yarns, and thin, open or weak places.

   The burlap shall be of sufficient length to cover all exposed surfaces.

   The burlap shall be kept continuously saturated with water for at least 72 hours following the placing of the concrete.

B. PROTECTION

The Contractor shall provide and maintain substantial barricades, warning signs, flares and, when required, watchmen to protect the new pavement and work site from vandalism and property destruction.

Any concrete showing injury from vandalism shall be repaired or removed and replaced at the Contractor's expense and to the Engineer's satisfaction. No heavy equipment or vehicular traffic shall be allowed on the new construction until the concrete has achieved a compressive strength of 2250 p.s.i. for LB-2750 or 3000 p.s.i. for L-3500 or seven (7) days have elapsed from date of placement. A longer period of time may be required if, in the opinion of the Engineer, the concrete is not of sufficient strength to support the equipment or vehicles.

No measurement or direct payment shall be made for curing and protection. Those items shall be considered subsidiary to other items of work for which direct payment is made.

4.08 TEMPORARY STOP PLANK

Temporary stop planks shall be placed at the ends of all streets and intersections when the extended street or side streets are unpaved. The temporary stop plank shall consist of a fir plank two inches by eight inches (2"x8") in size. It shall extend across the entire width of the roadway and shall be spiked securely to stout posts two feet in length, spaced not over five feet apart and driven well into the ground. The stop plank shall be backed with sufficient concrete to furnish proper support. The upper edge of the stop plank shall conform to the typical cross section for the concrete base.

No measurement or direct payment shall be made for the placement of the temporary stop plank. Placement of the stop plank shall be considered subsidiary to the items for which direct payment is made.

4.09 COLD WEATHER CONSTRUCTION

Portland Cement concrete paving work shall be accomplished only as provided in Section 1.06 of these Specifications.

4.10 SUBSTANTIAL COMPLETION

Paving construction will be considered substantially complete when it meets all of the requirements of Section 1.07 of these Specifications.